# ENVIRONMENTAL PRODUCT DECLARATION

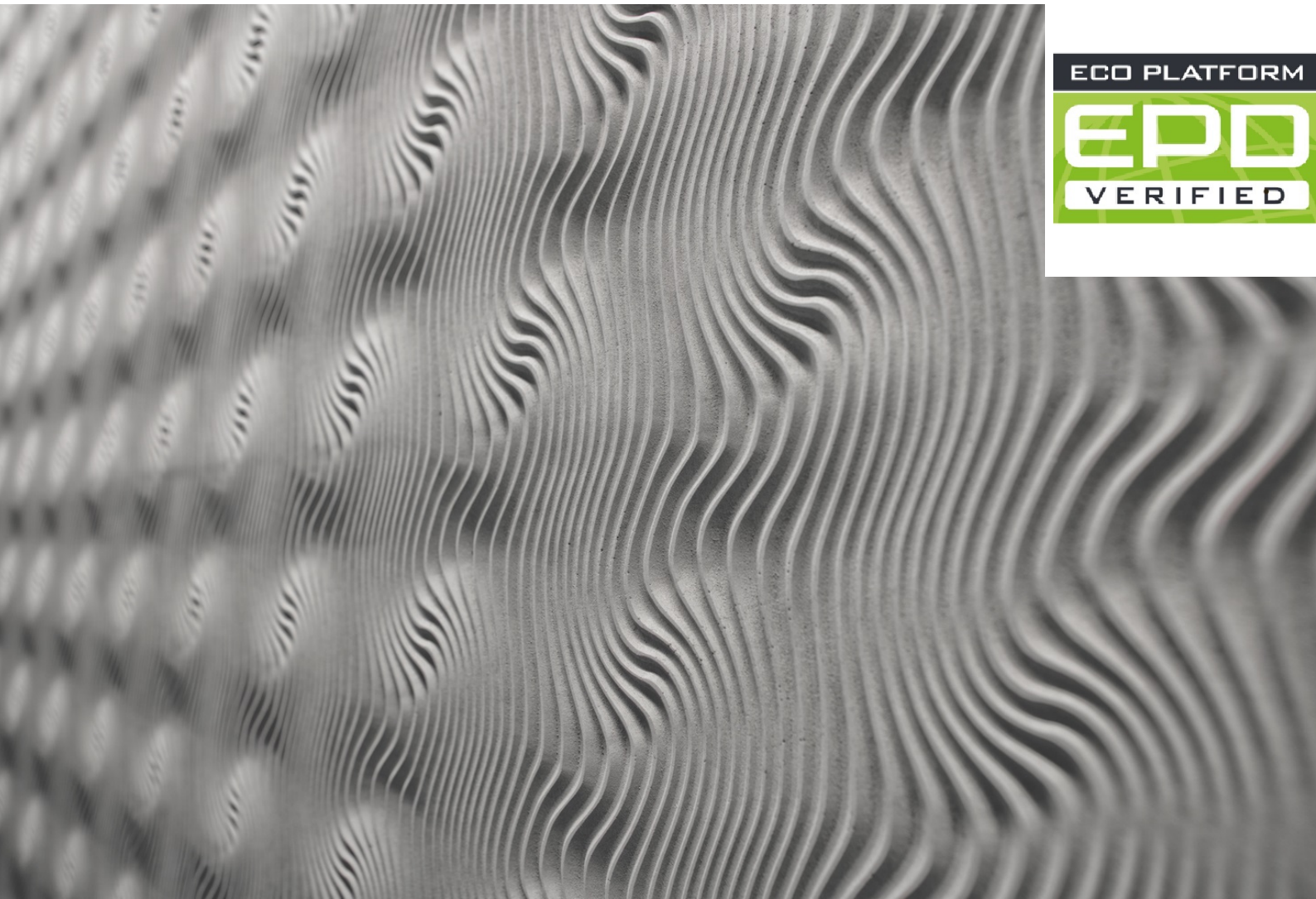
as per *ISO 14025* and *EN 15804+A2*

| | |
|---|---|
| Owner of the Declaration | Sika Australia Pty Ltd |
| Publisher | Institut Bauen und Umwelt e.V. (IBU) |
| Programme holder | Institut Bauen und Umwelt e.V. (IBU) |
| Declaration number | EPD-SIK-20240239-CBA2-EN |
| Issue date | 22/07/2024 |
| Valid to | 21/07/2029 |

## Sika® Set Accelerator

## Sika Australia Pty Ltd

www.ibu-epd.com | https://epd-online.com



BUILDING TRUST

## General Information

### Sika Australia Pty Ltd

**Programme holder**

IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

**Declaration number**

EPD-SIK-20240239-CBA2-EN

**This declaration is based on the product category rules:**

Concrete admixtures, 01/08/2021
(PCR checked and approved by the SVR)

**Issue date**

22/07/2024

**Valid to**

21/07/2029

Dipl.-Ing. Hans Peters
(Chairman of Institut Bauen und Umwelt e.V.)

Florian Pronold
(Managing Director Institut Bauen und Umwelt e.V.)

### Sika® Set Accelerator

**Owner of the declaration**

Sika Australia Pty Ltd
Elizabeth Street 55
2164 Wetherill Park, NSW
Australia

**Declared product / declared unit**

1 kg of Sika® Set Accelerator with a density of 1.33 kg/l.

**Scope:**

This verified EPD relates to 1kg of Sika® Set Accelerator. It is manufactured at the plants of Sika Australia Pty Ltd in Wetherill Park (NSW 2164), Keysborough (VIC 3173), Pinkenba (QLD 4008), and Bibra Lake (WA 6163) in Australia. The production and transport data are representative for the period from July 2022 to June 2023. The results in this EPD are calculated using an LCA-tool verified by IBU in 2023.

The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804*.

**Verification**

| |
|---|
| The standard EN 15804 serves as the core PCR |
| Independent verification of the declaration and data according to ISO 14025:2011 |
| ☐ internally ☒ externally |

Matthias Schulz,
(Independent verifier)

## Product

### Product description/Product definition

Sika® Set Accelerator is produced from specially-selected salt compounds and additives. The admixture is a liquid agent that is introduced into concrete while it is being mixed. Depending on specific application, the typical dosage can range from 1000 ml to 2000 ml per 100 kg of total cementitious materials. Optimum dosage should be determined by site trials with the particular concrete mix design and materials. Users shall refer to the most recent Product Data Sheet for more information and advice.

Sika® Set Accelerator is accompanied by a declaration of performance, which conforms to the specifications outlined in Australian Standard *AS 1478.1-2000*, type Ac. The product is designed to accelerate the setting and increase the early strength of concrete. It can be used for various applications when there are requirements of early strength, faster finishing of concrete surfaces, and faster slip-form movement or in case of cold climate.

### Application

Sika® Set Accelerator is used as a constituent material to produce concrete. It can be used in combination with other Sika admixtures. All admixtures must be added separately and trials are recommended before use.

### Technical Data

Sika® Set Accelerator meets the requirements of *AS 1478.1-2000*, type Ac.

### Constructional data

| Name | Value | Unit |
|---|---|---|
| pH of admixture (AS 1478.1) | 7.0–9.0 | - |
| Relative density of admixture (AS 1478.1) | 1.31–1.35 | kg/l |
| Non-volatile content of admixture (AS 1478.1) | 33.0–37.0 | % |
| Chloride content of admixture (AS 1478.1) | ≤ 350 | g/l |
| Water content of concrete as % of control (AS 1478.1) | ≤ 105 | % |
| Intial setting time of concrete, deviation from control (AS 1012.18) | -3 to -1 | hour |
| Final setting time of concrete, deviation from control (AS 1012.18) | -3 to -1 | hour |
| Compressive strength of concrete as % of control at 3 days (AS 1012.9) | ≥ 100 | % |
| Compressive strength of concrete as % of control at 7 days (AS 1012.9) | ≥ 100 | % |
| Compressive strength of concrete as % of control at 28 days (AS 1012.9) | ≥ 100 | % |
| Compressive strength of concrete as % of control at 90 days (AS 1012.9) | ≥ 90 | % |

Additional technical data are not relevant for this product.

### Base materials/Ancillary materials

The raw materials and additives of Sika® Set Accelerator can be given as follows:

| Name | Value | Unit |
|---|---|---|
| Selected salt compounds (*) | 20–50 | % |
| Water | 40–70 | % |
| Additives | < 10 | % |

(*) *Solid*

With respect to international and local regulations:

- This product/article/at least one partial article contains substances listed in the 'Candidate List of Substances of Very High Concern (*SVHC*) for Authorisation' (date: 30/05/2024) exceeding 0.1 percentage by mass: No.
- Biocide products were added to this construction product or it has been treated with biocide products (this then concerns a treated product as defined by the (EU) Ordinance on Biocide Products No. 528/2012): No.
- Any applicable prohibition, authorisation and restricted use requirements for this product, including for carcinogens referred to in Schedule 10 of the Australian Model Work Health and Safety Regulations (*WHS*): No.

### Reference service life

The durability of concrete admixtures is normally at least as long as the lifetime of the building in which it is used. The experimental data show that the reference life is greater than 50 years. The documentation of the Reference service life is not required for the EPDs calculated using the EPD tool from Sika since the entire life cycle is not declared. Only modules A1-A3, A4, A5, C1, C2, C4, and D are considered.

## LCA: Calculation rules

### Declared Unit

The EPD refers to the declared unit of 1kg of concrete admixture applied into the building with a density of 1.33 g/ml in accordance with *IBU PCR 04-2023 Part B* for concrete admixtures.

### Declared unit and mass reference

| Name | Value | Unit |
|---|---|---|
| Declared unit | 1 | kg |
| Gross density | 1330 | $kg/m^3$ |

Other declared units are allowed if the conversion is shown transparently.

### System boundary

Declaration type with respect to life cycle stages covered according to clause 5.2 EN 15804+A2 is cradle to gate with modules C1–C4 and module D (A1–A3, A4, A5, C and D).
Modules taken into account:

- A1 Production of preliminary products
- A2 Transport to the plant
- A3 Production including provision of energy, production of auxiliaries and consumables and waste treatment
- A4 Transport from the construction site to the installation site
- A5 Installation, admixtures applied into the building during A5 phase operations. At this stage, an impact of the production and treatment of installation residue equal to 1% of the product is considered.
- C1-C2-C4-D

The building deconstruction (demolition process) takes place in C1 module which considers energy production and consumption in terms of diesel and all the emissions connected with the fuel-burning process. After the demolition, the admixture is transported to the end-of-life processing (C2 module) where all the impacts related to the transport processes are considered.

One scenario is considered for the final treatment of the waste:

- 100% disposal (C4), modelled by landfill process where admixtures end their life cycle.

Module D accounts for benefits that are beyond the defined system boundaries. Credits are generated during the incineration of the installation scrap in module A5.

### Geographic Representativeness

Land or region, in which the declared product system is manufactured, used or handled at the end of the product´s lifespan: Australia

### Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account. Sphera *LCA for Expert* software (former GaBi) (version 10) and *Managed LCA Content* (2022.2) have been used.

## LCA: Scenarios and additional technical information

### Characteristic product properties of biogenic carbon

No biogenic carbon containing material was intended to be used in the product and accompanying packaging.

### Information on describing the biogenic carbon content at factory gate

| Name | Value | Unit |
|---|---|---|
| Biogenic carbon content in product | - | kg C |
| Biogenic carbon content in accompanying packaging | - | kg C |

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of $CO_2$.

### Transport from the gate to the site (A4)

| Name | Value | Unit |
|---|---|---|
| Transport distance | 99 | km |
| Gross weight | 34–40 | t |
| Payload capacity | 27 | t |

### Assembly (A5)

| Name | Value | Unit |
|---|---|---|
| Material loss | 0.01 | kg |
| Other resources | - | kg |

Material loss regards the amount of product not used during the application phase into the building. This amount is 1% of the product, impacts related to the production of this part are charged to the A5 module. This percentage is considered as waste to incineration since the product has a calorific value and impacts of its end of life have been considered in the LCA model and declared in A5.

### End of life (C1-C4)

C1: This module considers the use of machinery (7.5E-5 kg of diesel for kg handled) to dismantle the product to enable its subsequent transport.
C2: The concrete demolition waste is transported from the building site to a treatment plant or disposal site by truck and an average distance of 50 km is considered.
C4: The results for the end-of-life are declared for one scenario:

| Name | Value | Unit |
|---|---|---|
| Landfill percentage | 100 | % |
| Material to landfill | 1 | kg |

## LCA: Results

**DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)**

| Product stage | | | Construction process stage | | Use stage | | | | | | | End of life stage | | | | Benefits and loads beyond the system boundaries |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Raw material supply | Transport | Manufacturing | Transport from the gate to the site | Assembly | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction demolition | Transport | Waste processing | Disposal | Reuse-Recovery-Recycling-potential |
| **A1** | **A2** | **A3** | **A4** | **A5** | **B1** | **B2** | **B3** | **B4** | **B5** | **B6** | **B7** | **C1** | **C2** | **C3** | **C4** | **D** |
| X | X | X | X | X | MND | MND | MNR | MNR | MNR | MND | MND | X | X | MND | X | X |

**RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 kg Sika® Set Accelerator**

| Parameter | Unit | A1-A3 | A4 | A5 | C1 | C2 | C4 | D |
|---|---|---|---|---|---|---|---|---|
| GWP-total | kg $CO_2$ eq | 2.12E-01 | 4.95E-03 | 1.4E-02 | 2.82E-04 | 6.27E-03 | 4.33E-02 | -5.46E-03 |
| GWP-fossil | kg $CO_2$ eq | 2.09E-01 | 4.74E-03 | 8.26E-03 | 2.7E-04 | 6E-03 | 4.29E-02 | -5.46E-03 |
| GWP-biogenic | kg $CO_2$ eq | 3.7E-03 | 2.1E-04 | 5.76E-03 | 1.21E-05 | 2.65E-04 | 4.41E-04 | 8.95E-07 |
| GWP-luluc | kg $CO_2$ eq | 1.29E-05 | 1.24E-07 | 1.99E-07 | 7.16E-09 | 1.56E-07 | 1.53E-05 | -2.59E-06 |
| ODP | kg CFC11 eq | 2.72E-13 | 4.65E-16 | 3.38E-15 | 2.69E-17 | 5.88E-16 | 6.67E-14 | -1.85E-14 |
| AP | mol $H^+$ eq | 1.57E-03 | 1.45E-05 | 2.24E-05 | 3.66E-06 | 2E-05 | 2.12E-04 | -1.78E-05 |
| EP-freshwater | kg P eq | 1.16E-06 | 5.99E-10 | 1.2E-08 | 3.47E-11 | 7.56E-10 | 1.33E-07 | -1.86E-09 |
| EP-marine | kg N eq | 4.28E-04 | 6.47E-06 | 6.81E-06 | 1.65E-06 | 9.02E-06 | 5.73E-05 | -3.93E-06 |
| EP-terrestrial | mol N eq | 4.72E-03 | 7.11E-05 | 7.88E-05 | 1.81E-05 | 9.93E-05 | 6.3E-04 | -4.28E-05 |
| POCP | kg NMVOC eq | 1.19E-03 | 1.31E-05 | 1.85E-05 | 4.96E-06 | 1.8E-05 | 1.57E-04 | -1.17E-05 |
| ADPE | kg Sb eq | 4.52E-08 | 1.92E-10 | 5.27E-10 | 1.11E-11 | 2.43E-10 | 1.14E-08 | -3.32E-10 |
| ADPF | MJ | 3.37E+00 | 6.56E-02 | 4.04E-02 | 3.8E-03 | 8.29E-02 | 6.22E-01 | -5.87E-02 |
| WDP | $m^3$ world eq deprived | 5.31E-02 | 4.04E-05 | 1.83E-03 | 2.34E-06 | 5.1E-05 | 2.6E-03 | -1.53E-03 |

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential)

**RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 kg Sika® Set Accelerator**

| Parameter | Unit | A1-A3 | A4 | A5 | C1 | C2 | C4 | D |
|---|---|---|---|---|---|---|---|---|
| PERE | MJ | 2.16E-01 | 3.55E-04 | 2.65E-03 | 2.06E-05 | 4.49E-04 | 6.01E-02 | -1.31E-02 |
| PERM | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PERT | MJ | 2.16E-01 | 3.55E-04 | 2.65E-03 | 2.06E-05 | 4.49E-04 | 6.01E-02 | -1.31E-02 |
| PENRE | MJ | 1.96E+00 | 6.57E-02 | 5.54E-02 | 3.8E-03 | 8.3E-02 | 6.41E-01 | -5.87E-02 |
| PENRM | MJ | 1.43E+00 | 0 | -1.48E-02 | 0 | 0 | 0 | 0 |
| PENRT | MJ | 3.4E+00 | 6.57E-02 | 4.07E-02 | 3.8E-03 | 8.3E-02 | 6.41E-01 | -5.87E-02 |
| SM | kg | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| RSF | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NRSF | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FW | $m^3$ | 1.3E-03 | 1.02E-06 | 4.31E-05 | 5.89E-08 | 1.29E-06 | 9.2E-05 | -3.64E-05 |

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

**RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 kg Sika® Set Accelerator**

| Parameter | Unit | A1-A3 | A4 | A5 | C1 | C2 | C4 | D |
|---|---|---|---|---|---|---|---|---|
| HWD | kg | 2.29E-10 | 1.65E-13 | 2.64E-12 | 9.52E-15 | 2.08E-13 | 2.4E-11 | -5.45E-12 |
| NHWD | kg | 5.74E-03 | 2.72E-06 | 1.88E-03 | 1.58E-07 | 3.44E-06 | 1E+00 | -2.47E-05 |
| RWD | kg | 7.44E-05 | 3.7E-08 | 9.16E-07 | 2.14E-09 | 4.67E-08 | 5.63E-06 | -1.1E-06 |
| CRU | kg | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MFR | kg | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MER | kg | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EEE | MJ | 0 | 0 | 2.21E-02 | 0 | 0 | 0 | 0 |
| EET | MJ | 0 | 0 | 6.23E-03 | 0 | 0 | 0 | 0 |

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy

**RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional:**
**1 kg Sika® Set Accelerator**

| Parameter | Unit | A1-A3 | A4 | A5 | C1 | C2 | C4 | D |
|---|---|---|---|---|---|---|---|---|
| PM | Disease incidence | 2.48E-08 | 8.04E-11 | 2.87E-10 | 1.93E-10 | 1.08E-10 | 2.21E-09 | -2.44E-10 |
| IR | kBq U235 eq | 6.22E-03 | 2.45E-06 | 7.68E-05 | 1.42E-07 | 3.1E-06 | 5.17E-04 | -6.87E-05 |
| ETP-fw | CTUe | 2.84E+00 | 7.77E-02 | 3.23E-02 | 4.5E-03 | 9.82E-02 | 3.47E-01 | -1.06E-02 |
| HTP-c | CTUh | 1.12E-10 | 1.25E-12 | 1.73E-12 | 7.22E-14 | 1.58E-12 | 3.35E-11 | -1.01E-12 |
| HTP-nc | CTUh | 1.1E-08 | 4.28E-11 | 1.75E-10 | 3.5E-12 | 5.47E-11 | 3.51E-09 | -2.62E-11 |
| SQP | SQP | 1.34E-01 | 1.94E-04 | 2.13E-03 | 1.12E-05 | 2.45E-04 | 7.32E-02 | -5.63E-03 |

PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index

Disclaimer 1 – for the indicator 'Potential Human exposure efficiency relative to U235'. This impact category deals mainly with the eventual impact of low-dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators 'abiotic depletion potential for non-fossil resources', 'abiotic depletion potential for fossil resources', 'water (user) deprivation potential, deprivation-weighted water consumption', 'potential comparative toxic unit for ecosystems', 'potential comparative toxic unit for humans – cancerogenic', 'Potential comparative toxic unit for humans - not cancerogenic', 'potential soil quality index'. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator. This EPD was created using a software tool.

## References


**AS 1012.9:2014**
Methods of testing concrete - Method 9: Determination of the compressive strength of concrete specimens

**AS 1012.18-1996 (R-2014)**
Methods of testing concrete - Method 18: Determination of setting time of fresh concrete, mortar and grout by penetration resistance

**AS 1478.1-2000**
Chemical admixtures for concrete, mortar and grout - Part 1: Admixtures for concrete

**Candidate List of SVHC**
Candidate List of Substances of Very High Concern for Authorisation, European Chemicals Agency (ECHA), 2024, https://echa.europa.eu/candidate-list-table

**EN 15804:2012+A2:2019+AC:2021**
Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

**ISO 14025:2011**
Environmental labels and declarations — Type III environmental declarations — Principles and procedures

**Model WHS Regulations**
Schedule 10 Prohibited carcinogens, restricted carcinogens and restricted hazardous chemicals, Australian Model Work Health and Safety Regulations, 08-2023

**Further References**

**IBU General Instructions**
General Instructions for the EPD programme of Institut Bauen und Umwelt e.V., Version 2.1, Berlin: Institut Bauen und Umwelt e.V., 2022, www.ibu-epd.com

**LCA Calculator**
LCA Calculator software (version 6), by Sphera Solutions GmbH, Leinfelden-Echterdingen, 2024

**LCA for Expert**
Life cycle assessment software (version 10), by Sphera Solutions GmbH, Leinfelden-Echterdingen, 2022, https://sphera.com/life-cycle-assessment-lca-software/

**Managed LCA Content**
Life Cycle Assessment databases, Sphera Solutions GmbH, Leinfelden-Echterdingen, 2022, https://sphera.com/life-cycle-assessment-lca-database/

**PCR Part A**
PCR - Part A: Calculation rules for the Life Cycle Assessment and Requirements on the Background Report, version 1.4, Institut Bauen und Umwelt e.V., 04-2024

**PCR Part B**
PCR – Part B: Requirements on the EPD for Concrete admixtures, Institut Bauen und Umwelt e.V., 04-2023

**Publisher**

Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

+49 (0)30 3087748- 0
info@ibu-epd.com
www.ibu-epd.com

**Programme holder**

Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

+49 (0)30 3087748- 0
info@ibu-epd.com
www.ibu-epd.com

**Author of the Life Cycle Assessment**

Sphera Solutions GmbH
Hauptstraße 111- 113
70771 Leinfelden-Echterdingen
Germany

+49 (0)711 341817-0
info@sphera.com
www.sphera.com

**Owner of the Declaration**

Sika Australia Pty Ltd
Elizabeth Street 55
2164 Wetherill Park, NSW
Australia

+61 2 9725 1145
sustainability@au.sika.com
aus.sika.com